directly surrounded by the cytoplasm. The nucleolus then gradually assumes a rounded form, in which are seen 14 deeply stained tetrads that differentiate later into 28 chromosomes. The chromosomes become united in pairs and 14 bivalent chromosomes are established. The spindle is at first multipolar, but gradually becomes bipolar. The daughter chromosomes grouped at the poles, after the first division, again take the form of nucleoli in the daughter nuclei. In the second division 14 chromosomes are clearly distinguishable in the polar view of the equatorial plate. Consequently in *Spirogyra jugalis* 14 is the haploid number of chromosomes and 28 the diploid number.—SHIGÉO YAMANOUCHI.

Oxidizing enzymes.—EULER and BOLIN[35] have published a third paper on oxidizing enzymes. They have developed a method for the quantitative determination of peroxidase. They have also devised methods for the purification of the peroxidase of the horseradish, which gives a far superior product to that obtained by BACH and CHODAT. The most highly purified product showed 10.4 per cent of nitrogen and 2.5 per cent of ash. Contrary to the belief of many, the action of this substance cannot be attributed to the trivalent iron and chinons it contains, but it is a true enzyme. They believe the peroxidases of various plants are not identical.

The oxidase of *Rhus vernicifera* was purified and compared with the oxidase of Medicago, which they have already studied in great detail.[36] The latter they have shown to be a mixture of calcium salts of various oxy-acids and it is not destroyed by boiling in water. The former contains nitrogen and is very sensitive to heat. Contrary to the contention of many, they find that the action of Rhus oxydase cannot be attributed to the joint action of contained manganese and hydroxyl, for it is equally effective in slightly acid, neutral, and slightly basic solutions.

These investigators, through their excellent chemical training, are making valuable contributions in this important field of plant physiology.—WM. CROCKER.

The giant form of Primula sinensis.—GREGORY[37] has examined the giant form of *Primula sinensis*, thinking it might have the tetraploid number of chromosomes, as Miss LUTZ and the reviewer found to be the case in *Oenothera gigas*. A doubling, however, does not occur, the numbers being 12 and 24, as in the ordinary form of *Primula sinensis*. It should be said that this giant Primula differs from the ordinary form in practically no respect except the larger size of its organs, while in *O. gigas* many of the characters have been sharply modified from those of *O. Lamarckiana*. While GREGORY finds the number of the chromosomes unchanged, he believes that the chromosomes are larger in the giant form,

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[35] EULER, H., UND BOLIN, IVAN, Zur Kenntnis biologisch wichtiger Oxydationen. III. Zeit. Physiol. Chemie **61**:72–92. 1909.

[36] *Ibid.* **61**:1–15. 1909.

[37] GREGORY, R. P., Note on the histology of the giant and ordinary forms of *Primula sinensis*. Proc. Cambridge Phil. Soc. **15**^{3}:239–246. *pl. 10.* 1909.